January 2021

ROTARY RECESS HINGE FOR CABLE ROUTING

HP INC

Rotary Recess Hinge for Cable Routing

Abstract: Fabricating a rotary recess in a hinge that connects two halves of a clamshell and routing a connecting cable in the recess enables thinner laptop and notebook computers to be manufactured without compromising reliability.

This disclosure relates to the field of laptop and notebook computers.

A technique is disclosed that improves cable routing through a hinge in thinner computers.

There is a frequent desire to make the enclosure of laptop and notebook computers thinner and thinner over time. One technique for doing so is to route a cable through the hinge of a clamshell case in order to connect the electronics on the keyboard half to the electronics on the display half. However, as the thickness of the computer decreases so does the diameter of the shaft of the hinge, which results in less space for routing the cable through the hinges. To make more room for the cables, one approach has been to cut a region of the shaft along its length, changing the cross-sectional profile of the shaft from an "O" shape to a "D" shape. However, doing so significantly reduces the mechanical strength of the shaft - in some cases, by about 70%. This adversely affects hinge reliability. In addition, because the cable sits against the flat surface of the shaft, the cable itself can become worn due to the frequent rotation of the hinge against it during opening and closing of the clamshell, which can cause wires in the cable to break.

According to the present disclosure, and as understood with reference to the Figure, instead of cutting a flat surface along the shaft 20 of a hinge 10, a rotary recess 25 is cut in the shaft 20 with dimensions that accommodate a cable 30. The recess 25 can be formed by turning and milling operations. The rotary recess 25 removes less material from the shaft 20 than does a flat surface cut and does so only in the region where the cable 30 will be routed. As a result, the rotary recess 25 reduces the strength of the shaft by only about 20%, rather than 70%. This results in a stronger and more reliable hinge. In addition, routing the cable 30 in the recess 25 reduces the wear on the cable 30 during opening and closing, thus enhancing cable life.

The disclosed technique advantageously allows a thinner Z height laptop or notebook computer to be constructed without compromising hinge reliability and hinge cable life.

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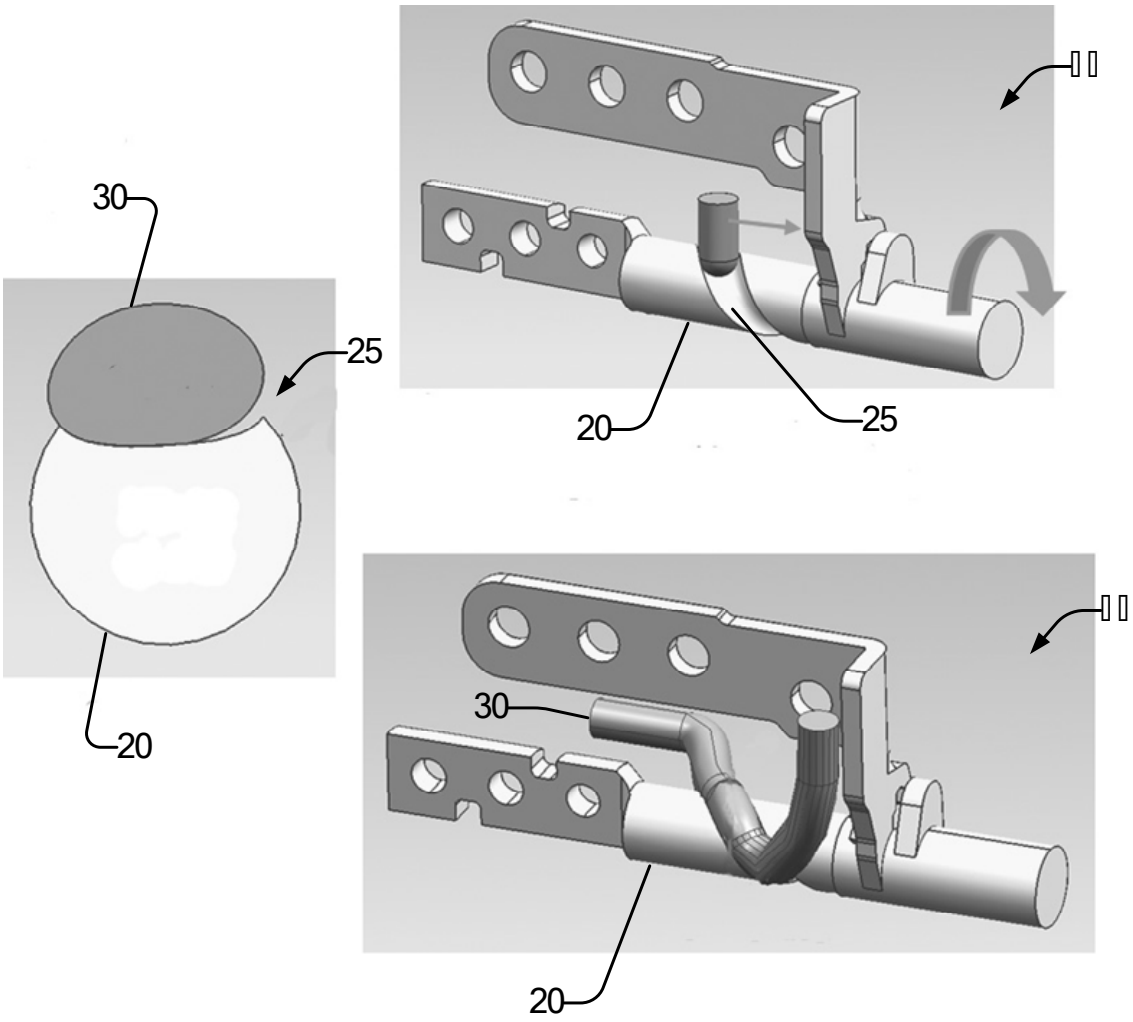
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